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ABSTRACT

Because of dramatic changes in the technology of written communication, college graduates are now producing letters, memos, and reports by dictating for word processing systems. Case studies from structured interviews with 28 people in business, industry, government, and the professions show that the composing process of writers who use the new systems includes three stages: predictation planning, dictating, and revising, editing, and correcting. Difficulties in each stage stem from differences between the recursive writing process and the requirements of producing speech that sounds like writing. Among the difficulties are (1) thinking through paragraphs, sentences, phrases, and words in advance: (2) attending simultaneously to the needs of the long term audience (the addressee) and the short term audience (the keyboard operator): and (3) making appropriate stylistic adjustments between habits of speech and conventions of writing. College writing teachers can prepare students to address these problems by helping them adapt the familiar process of writing to the unfamiliar requirements of speaking writing. (Copies of dictated letters with revisions marked are appended.) (HTH)

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PAPER VOICES: HOW DICTATION AND WORD PROCESSING ARE CHANGING THE WAY COLLEGE GRADUATES WRITE

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PAPER VOICES: HOW DICTATION AND WORD PROCESSING ARE CHANGING THE WAY COLLEGE GRADUATES WRITE

> "Now when you spoke you ... were obliged to sound a little bit like writing quite regularly or perhaps even always .... You were expected ... to let your speech be colored by the way writing was or could be done."
>
> Walter Ong, Interfaces of the Word, p. 87.

Because of dramatic changes in the management of written communication in business, industry, government, and the professions, college graduates are not writing as they were taught to write. Instead of being physically engaged in the recursive pen-in-hand process, they are dictating their communications. Their dictated tapes are being filed at typing pools, transcribed at keyboards attached to video displays, proofread on display screens, and returned to the "writers" as final products, drafts, or records. College graduates are using a new mode of communication: they are speaking writing. And current research in voice-activated word processing equipment is intensifying the pressure to speak writing effectively.[1]

While the recursive model of the composing process has provided valuable insight into how students write, even this useful model requires adaptation to adequately describe the way people now produce letters, memos, and reports on their jobs.[2] Students must be shown that dictation and word processing are rapidly combining speaking and writing, and that, as Walter Ong observed, "a new medium reinforces the earlier media by radically transforming them..."[3]

Since it is urgent that our graduates become effective users of dictation and word processing equipment, we as teachers must understand:

* how dictation and word processing are changing on-the-job writing;
* how writers now produce on-the-job communications;
* and how we can help students adapt their writing to the new technology.

How Dictation and Word Processing Are Changing On-the-job Writing

Most of us are aware of dictation/word processing equipment -- from offices with which we have contact and from advertisements; but few of us understand the widespread effects these systems are having on writing.

The rate of conversion to new dictation/word processing equipment is illustrated by examples from government, from business and industry, and from a national survey. Phoenix, Arizona, installed in 1978 a round-the-clock dictation-word-processing network through which city employees in their offices or out on a job could phone the word processing center, record their messages at the word processing keyboard, and have their communications ready to sign within a few hours. Less than two years later, one-third of the work at the Phoenix Center originated from its dictation network.[4] Manufacturing Data Systems International (MDSI), a medium-sized company which employs about 700 people, converted to a mechanized system in 1976. In 1970, 75% of the communications at MDSI were handwritten, and 25% were dictated to secretaries; in 1979, over 50% were dictated, 30% to cassette recorders and 20% to secretaries.[5] Word Processing Systems magazine conducted a survey in 1980 to which 66 companies responded. "Sixty-four percent indicated that the use of dictation equipment has increased in their organizations during the past year and seventy percent say they see the use of dictation equipment increasing during the coming year."[6]

The conversion from writing to dictation for word processing has now reached the point which ocean liners and jet planes reached in 1965: like the ocean liner, handwriting and dictation to a private secretary are being replaced by faster, more productive, most cost effective methods which, like the jet, will dominate the field in the next decade.[7]

Why Organizations Install Communications Systems

Dictation and transcription on word processing equipment can reduce the time devoted to written communication up to 60% for short or routine messages and somewhat less for long or complex messages.[8] And these time savings translate into sizable long-term cost savings for organizations investing in the equipment.[9] In addition, the new dictation systems provide greater flexibility and efficiency to users. The new systems also improve the quality of final products, according to psychologist Howard Gardner, by forcing the dictator to outline an entire argument in advance, increasing coherence and capturing fleeting thoughts or sequences of thought.[10] Finally, dictation/word processing systems produce exceptionally attractive copy, allowing transcribers to format communications by using the appropriate function keys or programs and to change or correct communications before printing, so that the final copy is flawless.

Because of the advantages of time, cost, flexibility, content quality, and output quality, there is little question that the conversion to mechanized systems, which began so rapidly in the 1970's, will transform the way our graduates write.

Why Some Writers Do Not Use the Systems

But for people who will use the new systems, the change is not always easy. A survey of 2000 randomly selected readers of Modern Office

Procedures showed that although seven in ten companies now have dictation/word processing systems, only one in three people who originate typewritten work actually uses the systems.[11] Although John Gould of IBM claims that writers can easily be trained to become effective dictators,[12] my research suggests that although they can, indeed, learn the mechanics of dictation in a day, the actual process of speaking writing goes against the grain of their experience and education. They tend to associate the recursive process of writing with thinking,[13] to rely on longhand drafts to turn their writer-based prose into reader-based prose,[14] and to use longhand revision quite literally as re-envisioning.[15] They have never been persuaded that they can transfer these useful attitudes toward writing to dictating.

While I am not suggesting that college English teachers teach dictation for word processing, I am suggesting that we prepare our students to understand how they will be producing communications once they graduate and how they can adapt the processes they have learned in our classes to whatever systems they encounter.

How Successful Writers Now Produce On-the-job Communications

In her 1980 study of writing tasks performed by 80 Philadelphia bank executives, Barrie Van Dyke noted three methods of composition typically used in preparing business communications on the new systems: dictating first-time-final letters, memos, and reports for word processing systems; handwriting complex or long communications -- either alone or as teams -- for typing by a secretary; and adapting standard letter and proposal forms for word processing.[16] While my own research substantiates Van Dyke's, it also shows that experienced writers draft communications of all types -- from credit letters to meeting minutes to long technical reports -- by

dictating for word processing and also that dictation is widely used in record-keeping.

My findings are based on 28 structured interviews, conducted May to November, 1980, with doctors, executives, general staff employees, lawyers, managers, professors, researchers, secretaries, and word processing personnel in Indiana, Michigan, New York, and Washington, D.C. During my site visits, I collected from each interviewee a completed three-page interview form;[17] sets of notes, tapes, drafts, and final communications; and materials furnished -- either by the home company, by dictation/word processing suppliers, or by independent publishers -- on how to use the new communication systems. The purposes of my research were three: 1) to discover how successful writers prepare their on-the-job communications; 2) to compare the process they think they go through, as described on their interview forms and in their conversations with me, with the actual process, as documented in their notes, tapes, drafts, and final communications; and 3) to generalize key features of dictation for word processing systems.

Preparing Communications

Of the 28 people I interviewed, 19 were responsible for composing internal and external written communications within their organizations. Of these, 10 consistently used dictation, 3 sometimes dictated and sometimes wrote their communications, and 6 always wrote in longhand, either giving the written version to a secretary or dictating from their written drafts. Though there was no correspondence between age and mode of communication, people in the highest positions always dictated their communications,[18] largely because dictation saved time and provided flexibility: they could dictate in the office, at home, on business trips, or while driving or flying. Their work was typed by a private secretary, group secretary, or

word processing pool typist. They produced four main kinds of communications: first-time-final letters, memos, or reports; drafts; adaptations of stored forms or texts; and records.

Defining the Process

Although all the interviewees who used dictation systems produced first-time-final communications, drafts, adapted forms, and records, the process they described differed, according to the kind of communication being dictated and to the relationship between the dictator and the transcriber. The communications fell into two general categories: first-time-final-products, including not only original documents but also some adapted form communications and all records; and drafts, which include both entirely original documents and adapted form communication in which chunks of original material are drafted, revised, then incorporated in the stored text. The descriptions the interviewees gave of the processes they went through sometimes differed from their actual practice, as you will see in the representative cases described below.

Case 1: Dictating First-time-final Communications

Professor Bernard A. Galler, Editor-in-Chief of The Annals the History of Computing and Associate Director of The University of Michigan Computing Center, generally dictates three kinds of communications in first-time-final form: letters, amendations of stored texts or lists, and directions to his secretary.[19] This case study of Galler's use of dictation for word processing includes his description of the process; a summary of his practice in producing one set of communications; and a comparison of his perceived and actual practice.

Perceived Process: When producing first-time-final communications, Galler generally dictates a group of communications in one stretch of

uninterrupted time, either in the evening or in the morning. To assure good results, he "never leaves a mistake on a tape.... If changes are minor, which is about 98% of the time, I attach a correction note and sign the letter. If substantial, because of new information or rethinking, I write 'please redo as shown,' but this is very rare." When asked to describe the process he goes through, Galler wrote on the structured interview form and discussed in the interview the following steps:

1 Consider audience, purpose, structure, and what the secretary will need in directions and documentation.

2 Assemble relevant materials, files.

3 Think through subject carefully, making notes as necessary.

4 Dictate at desk recorder, making very clear distinctions between text of letter and directions for secretary.

5 Replay dictation tape "to face up to what it's like to listen to."

6 Correct tape by backing up over errors and dictating again.

7 Deliver tape and related materials to secretary for typing on electronic or word processing typewriter.

8 Review letters for errors and indicate corrections on separate note; "I occasionally let a minor awkward word or repetition go through, which differs from my typical habit in writing."

9 Instruct secretary to correct and send letters, then return tape.

Actual Practice: When asked if he could document this process, Galler gave me the one-hour tape and the set of letters just transcribed from the tape, describing his activities as follows:

June 3 -- I came to the office in the evening, assembled the files pertaining to the The Annals, and dictated this tape, which includes letters, corrections for the stored contacts list for The Annals, and filing directions. I planned each unit of the dictation from the files before me and made sure the tape of that unit had no errors before moving to the next unit. I also assembled the files so the secretary could refer to

them as necessary, then put the tape and files on her desk.

June 4 -- The secretary had put the finished letters, with envelopes, and a new printout of the corrected contacts list on my desk by 11 the next morning. I proofread, clipped correction notes to certain pages, signed, and returned all the materials to the secretary. She corrected and mailed the letters (without reprinting), filed the copies, and the magnetic card and new printout of the list, then returned the tape to me for reuse.[20]

Comparing the Perceived and Actual Practice

In listening to the tapes and comparing them to the final copy Galler had given me, I found that he had an unusually complete awareness of the process he went through in dictating, from describing his pre-dictation planning to noting his revision procedure. Figure 1: First-time-final communication illustrates one letter transcribed from the tape and shows the pauses or mechanical tape stops Galler made while dictating this letter, his instructions to the typist, and her editing of the text.

Figure 1: Sample first-time-final communication, marked for pauses, tape stops, instructions to typist, and secretarial editing.

Galler stopped an average of once every 6.9 words in the three letters for voice pauses or tape stops, not including stops for instructions to his secretary. (Occasional double tape clicks suggest erasing and retaping.) The general precision of the letter dictation, plus the completeness of the directions to the secretary, produced three first-time-final letters, each of which bore a brief correction note to the secretary, the one shown above adding a name to the list receiving copies, one adding an

envelope mailing notation, and one fixing a misspelling.

Two features which Galler did not mention in the process he described were his planning acitivites during dictation and his secretary's editing during transcription. Although Galler clearly knew what he wanted to say before he began dictating, several tape and voice stops in each letter suggest that he planned his sentences and phrases as he was dictating, a strategy especially evident in the longer uncorrected sequences of tape. Also, Galler and his secretary were unaware that she had made minor changes in the letters, averaging three per letter, which showed up in the final copies. The changes fell into two classes: improvements (for instance, in "it was a great shock to me to learn," she omitted the "to me"), and mishearings of fuzzy words (for instance, instead of "get an idea about what," she typed "get an idea of what"). The secretary also added certain routine mechanical details, such as commas after salutations and closings, and italicization of The Annals, which were not indicated specifically in the dictation. In general, then, even the most experienced and efficient users of dictation are sometimes unaware of the entire process involved in preparing first-time-final communications.

The findings in this case study are corroborated by interviews and documentary evidence from three other executives who consistently dictate first-time-final communications: Percy Bates, Assistant Deputy Director of the United States Department of Education; Robert Hurst, Residence Division Manager, Michigan Bell Telephone; and Jack Manes, Vice-President, Manufacturing Data Systems International. There are, of course, individual variations in the procedure: Bates and Hurst make pre-dictation notes more often than Galler does; Manes does not generally review or revise his dictation, largely because he relies on his experienced private

secretary to polish phrases, words, and punctuation. Dictators who have new, group, or pool typists, on the other hand, usually produce polished tapes because they cannot rely on secretaries for correction.

Furthermore, the findings in this case study reflect the process of dictating adaptations of certain form communications and of dictating records -- with certain exceptions. In adapting forms, dictators attend less consistently to the needs of long-term audiences since stored materials are generally designed for specific groups; they attend less to planning paragraphs, sentences, phrases, and words and more to following systematic structures and language patterns established in the form; and they revise, edit, and correct far less, turning most of the responsibility for the finished product over to the transcriber.[21] In making records, dictators show little attention to long- or short-term audiences, attending mainly to reference notes for content, following a very structured organizational plan, and rarely revising or editing.[22] Since the purpose of record-keeping is always documentation, and the audience almost always the dictator, records are first-time-final in the purest sense of the phrase.

Case 2: Drafting

Dr. William C. Sonzogni, Director of Environmental Studies at the United States Great Lakes Basin Commission (GLBC), dictates journal articles and other papers, technical reports, letters, memos, and other short communications, such as summaries of meetings at which he serves as secretariat.[23]

Perceived Process: When producing communications, Sonzogni generally uses the GLBC dictation/word processing system for drafting. He does this because it is flexible -- "I don't have to be at my desk"; because it is fast -- "I can get something down quickly"; because it is convenient --

"I can dictate and revise at convenient times, see my progress, and have others comment on the text"; and because it is easy to edit -- "I can cut down my natural wordiness when I see a chunk of text typed on draft sheets." When asked to describe the process he typically goes through when he dictates, Sonzogni wrote on the structured interview guide and elaborated in the interview the following steps:

1. Jot down some ideas.
2. Think about ideas.
3. Consider questions or interests of readers.
4. Revise and add detail to notes.
5. Develop outline from notes, rank ordering inclusions, moving from what is most important to least important.
6. Assemble materials if necessary.
7. Dictate, rarely stopping to correct, but stopping between paragraphs to plan, sometimes adding afterthoughts to be inserted in correct position when revising draft.
8. Edit first draft for conciseness, clarity, sentence structure -- to make writing short and to the point ("I don't usually need to change organization.").
9. Ask others to respond to corrected second draft; make appropriate changes; have changes incorporated in final copy.
10. Proof final copy and distribute.

Actual Practice: When asked if he could document this process, Sonzogni gave me a file on a short communication he had just completed and explained it to me. On Tuesday, June 10, 1980, he had attended a meeting of the Great Lakes Basic Commission's Standing Committee on Research and Development (SCRD) in Traverse City, Michigan; he serves a secretariat of SCRD. One week later, he sent out to a distribution list of 23 members and interested parties a "Summary of Actions" which occurred during the SCRD meeting. He described the steps he went through as follows:

June 10 -- While attending the committee meeting, I jotted down a few notes; since I was very familiar with the subject matter, words and phrases were sufficient to trigger memory later.

FIGURE 2: Original notes for dictated draft, 6/10/80.

June 11 -- In my office, I added a few details and scoped the thing out; I organized notes according to the concerns and sensitivities of readers on the standard mailing lists, and I listed last names of participants at meeting.

FIGURE 3: Notes developed into outline before dictation, 6/11/80.

June 12 -- I dictated a rough draft from my outline in the grassy field next to the office parking lot and finished the dictation in my office. I rarely stopped to fix sentences but did stop between paragraphs to plan or add an afterthought for the secretary to insert. I gave the tape to our group secretary to type, double-spaced on large draft sheets, at the word processing keyboard.

FIGURE 4: Segment of tape transcribed 6/12/80 showing pauses, tape stops, and other dictation features, plus notations by secretary and dictator.

June 16 -- Over the weekend, I corrected the draft to cut out wordiness, then returned the corrected draft to the secretary and asked for a single-spaced second draft. She made the corrections at the word processing keyboard, checking off each correction in red pen on the original as she typed and asking me about unclear changes. She returned the second draft, single spaced on standard pages, and I edited it.

June 17 -- I showed the revised draft to Lee Botts, Chairman of the Great Lakes Basin Commission, who made several suggestions which led to one substantive change and four mechanical changes.

FIGURE 5: Segment of corrected second draft 6/15/80 with handwritten revision suggestion by outside reader, 6/16/80.

June 17 -- The secretary entered the changes Lee Botts and I had made, gave me a final copy to proofread, inserted the appropriate mailing label list, and sent out the summary to the people on the SCRD distribution list.

FIGURE 6: Segment of final copy 6/17/80.

Comparing the Perceived and Actual Practice

In examining the notes, comparing the dictation tape to the first printout, and analyzing the revised drafts and the final copy, I found that Sonzogni's perception of the process he went through coincided with his practice up to the point of actual dictation (Step 7), but that his assessment of how he dictated and revised (Steps 7 and 8) diverged considerably from his actual practice. Sonzogni did, indeed, expand his notes in detail, plan very thoroughly what he would include in terms of audience and purpose, and organize his thoughts carefully and effectively. In fact, his single sheet of notes from the meeting contained 5 lines with 23 words, while his two-page expansion of the notes contained 27 lines with 135 words, plus an abbreviated title and list of meeting participants, suggesting attention to purpose and audience. Furthermore, the arrow on the expanded notes, the cross-outs (9), the inserts (3), and the punctuation suggest attention to ordering his inclusions, to documenting and correcting his

content, and to establishing relationships between units of information. Before dictating, Sonzogni had developed a detailed and useful outline, which remained unchanged through the drafts to the final copy.

A close comparison of the dictated tape and the first draft, however, suggests three discrepancies between Sonzogni's perceived process and actual practice in dictation and revision. First, Sonzogni is aware that he stops to plan each new paragraph, which the audible tape stops confirm. But the tape stops (actual clicks) average one for every 14.7 words, and the speech stops (for long pauses, "uhms", throat clears, and coughs) average one for every 9 words. In fact, the "Summary of Actions" tape averages one stop for every 5.5 words of dictation, not including interruptions for directions to the secretary. This tape suggests that Sonzogni dictates mainly in phrases, considering very carefully short groups of words or single words before uttering them; he paused 21 times before phrases and 26 times before single words. The greatest fluency occurred with stock phrases, such as the "NOAA-Sponsored Five-Year Plan of a Great Lakes Research Development and Monitoring," which was eventually shortened in the draft, or "the urgent need for additional information on human health risks from contaminants found in the lakes." Such phrases are apparently so familiar they do not require the careful consideration reflected by frequent tape or verbal stops. The fluency associated with dictation, or what Sonzogni called getting "something down quickly," seems to arise largely from the speed with which phrases, especially stock phrases, can be articulated, as compared with time it takes to write them.

This brings up a second interesting discrepancy between the perception of the composing process during dictation and the actual practice. Sonzogni -- and many others who dictate and revise drafts -- believe that they cut out many needless words in revision, editing, as Sonzogni phrased it, "to

improve conciseness, clarity, and sentence structure." Actually, the first draft of the "Summary" was 646 words long and the second draft was 695 words long, a total addition of 49 words. While 52 words on the first draft were scratched out, 101 were added, not including the complete title and attachment lines. The deletions removed several repetitions of committee or project names and combined a few sentences, while the additions clarified details through the inclusion of new material or through rewording. But the revision and editing did not remedy the stylistic problems which characterized this text: passive constructions, repetition of certain words, and awkward or ambiguous phrasing.

Of the 25 sentences in the "Summary", 13 are in passive voice, and two give the impression of being passive through participial or adjectival combinations ("needs were recurrent" and "studies are ongoing"). While scientific or technical writing is often characterized by the use of passive constructions, and Dr. Sonzogni is in the habit of writing scientific and technical reports, neither the purpose of nor the occasion for this report requires the passive. Since the use of the passive voice typically adds two words to the main clause of a sentence, and since no passives were converted to actives during revision, an obvious remedy for wordiness (which would have cut at least 26 words) was overlooked in revision, despite the goal of conciseness.

Similarly, repetitions of apparently important words were not corrected, diminishing not only stylistic effectiveness but also clarity of emphasis. The repetition of certain words -- "needs" (9 repetitions; 5 in one paragraph), "major" (4 repetitions; 3 in one paragraph), and "ongoing" (3 repetitions; 2 in one paragraph) -- is probably speech-related. Since the ephemeral nature of speech allows for more repetition in general, since the spoken vocabulary

is more time-restricted than the written -- it is harder to dwell on getting just the right word when talking -- and since most of us do not use certain words in our spoken vocabulary as often as we do in writing ("emphemeral" in this sentence is an example), repetition is likely to occur in dictated writing.[24]

Finally, Sonzonyi did not revise awkward phrases, clauses, and sentences. Consider, for example, "several major research needs were recurrent" and "no major Great Lakes studies of such proportions are ongoing." Since Sonzonyi spoke easily and fluently in his interviews with me, it is hard to imagine him using these clauses in conversation; but since they were allowed to stand in the typed draft until edited by an outside reader, it is likely that the reinforcement of having spoken and heard such statements made them acceptable in the draft -- where errors of fact were decisively edited.

Why didn't Sonzonyi's revision improve conciseness, clarity, and sentence structure, as he had anticipated? Perhaps the speaking-hearing context of dictation mitigates against stylistic revision.[25] Writers are often encouraged to write in a way that "sounds" right to them, are encouraged, in fact, to read their writing aloud to make sure it "flows." This advice suggests, first, that articulating sentences or phrases will alert the writer to passages which do not move "trippingly on the tongue" and may therefore be awkward to read. Advice to read aloud also suggests that hearing a written text will serve as a check on irregular or non-euphonious constructions. But if the written text originated as speech and has already been articulated and heard, then inelegant, repetitious, or even incorrect phrasings are less likely to sound wrong to the mind's ear. Those who revise dictated drafts may be less likely to improve infelicities of style than to correct errors of

content, suggesting that special training may be necessary for revising dictated drafts.

A third discrepancy between Sonzyni's perceived process and his actual practice is the omission of reference to the editorial role of the secretary. In his description of the steps in dictating for word processing, he referred to certain activities of the secretary, but he did not suggest how pervasive her influence was as an audience or as an editor. In taping, Sonzogni averaged one secretarial direction in every 13.6 words he dictated, including directions for beginning, ending, punctuating, numbering, changing, and inserting. In transcribing, the secretary included more than twice as many punctuation marks (64) as Sonzonyi had dictated (31). The secretary was clearly an unreported short-term audience who was occasionally forgotten when Sonzonyi concentrated on his long-term audiences; she was also an unacknowledged editor from the first draft to the last.

Sonzongi's directions to the secretary suggest two observations. First, the process of dictation differs from the process of writing because the former requires that the dictator consistently keep in mind a short-term audience, while the latter allows the writer to finish composing before considering the needs of the short-term audience. That is, the dictator must anticipate problems a typist may have, while a writer can draft, revise, edit, and <u>then</u> correct his writing or add notes for the typist. Second, the production of coherent and correct drafts depends on the dictator's familiarity with what the typist knows about the subject, the situation, the intention of the dictator, and the form and surface features required in a given communication. So much "went without saying" in this tape that the relationship between dictator and transcriber must be considered an unusually important though often neglected consideration in dictation.

Although each dictator, like each writer, has a unique way of composing a text, Sonzogni's process in drafting is quite consistent with those described in the literature and by other interviewees. In terms of planning, psychologist Howard Gardner explains: "Before I start to dictate, I ... do the required reading, digest the material, and think about it; I then jot down an outline of a page or so, listing in order the major points I want to make. Then ... I begin talking into the machine as if I were lecturing to a small group of students."[26] In terms of actual draft dictation, many dictators, such as Tim Montheith, water resources engineer at GLBC, dictate more fluently, that is, with fewer pauses or tape stops, than Sonzogni, expecting to correct phrasings and other details on the printed draft.[27] In terms of revising and editing, almost all of my interviewees expected to revise and edit their drafts considerably and to have input from others before producing the final copy. Earl McIntyre of Manufacturing Data Systems International, for example, stated that approximately one in four letters drafted in the credit department was circulated to one or more readers before a final corrected copy was printed and mailed.[28] While most dictators recognize the important role of the secretary in editing superficial features of a communication, they are rarely aware that their own emphasis in editing is directed toward content rather than style.

Key Features of Dictation for Word Processing Systems

Analysis of the Galler and Sonzogni materials shows that the composing process in dictating first-time-final or draft communications includes three stages: pre-dictation planning; dictating; and revising, editing, and correcting. However, certain sub-processes differ substantially, depending on whether the dictation is intended to produce a final copy or a draft.

Stage 1: Pre-dictation Planning

Planning first-time final and drafted communications have in common: clarification of purpose; careful assembling of references; consideration of long-term audiences; and close attention to content, organization, and distinctions between habits of speaking and conventions of writing. Although anticipating distinctions between speaking and writing occurs in both categories, it is much more evident in the producers of first-time-final communications because, as Robert Hurst of Michigan Bell noted, "every word reflects the image of the writer." Experience apparently teaches dictators to distinguish between speaking and writing and to plan accordingly.

Pre-dictation planning differs considerably in certain sub-processes within each category, especially in attending to the needs of the short-term audience and in making notes and outlines. For first-time-final communications, the dictator must pay consistent and simultaneous attention to the needs of the long-term audience, the addressee, and of the short-term audience, the typist. For drafts, the dictator often overlooks the needs of the short-term audience, adding afterthoughts as they occur, ignoring punctuation and formal signals, and revising or correcting on the print-out. Attention to notes and outlines also differs. Because a first-time-final dictation is often a relatively short response to specific, familiar subject matter, it may require notation but it rarely requires outlining -- at least by experienced dictators.[29] However, pre-dictation planning for drafts -- especially when the communications contain detailed information intended for a large or diverse audience -- requires the careful development of ideas in outline form, the filling in of factual details, and often the recasting of the outline in terms of purpose and long-term audience. This is especially true in drafting reports for internal or external circulation.

Stage 2: Dictating

Like writing, dictating first-time-final or draft communications requires a variety of recurrent activities. Though the purpose, audience, and overall structure of the communication are planned before the dictation begins, frequent pauses suggest that planning paragraphs, sentences, phrases, and words occurs during dictation. Dictation in both categories is also characterized by careful attention to the addition of new information. Though this is less frequent in first-time-final communications, it is also more carefully executed; the additions are signalled in notes to the transcriber or in a space left at the beginning of each tape for additions and/or directions to the transcriber.

Dictators of first-time-final communications also give much more attention to the following activities than do drafters: giving directions to the transcriber; planning phrases and words; and editing or correcting the tape. In fact, in first-time-final messages, editing for style is most important, while in drafting, stylistic editing is negligible and content editing is emphasized.

Stage 3: Revising, Editing, and Correcting

Understandably, these processes differ considerably in first-time-final and draft communications. In final-form dictation, revision generally occurs on the tape and is limited to rephrasings, rewordings, and the addition of secretarial directions; it may occur during dictation or during the final review of the tape. Correction -- by the secretary, the dictator, or both -- occurs during and after transcription, is minor, and generally requires neither retyping nor reprinting.

In draft dictation, revision and editing generally occur not on the tape but on the printouts and are done by the dictator, the secretary, and

outside readers. Revision and editing by the dictator are more contextual than stylistic; by the secretary, more mechanical than contextual or stylistic; and by outside readers, contextual, stylistic, and mechanical. Since the writer is likely to go through several drafts and since only the revisions are retyped on the stored copy, there are few, if any, corrections on the final copy.

Although the process of dictation for word processing systems includes a pre-dictation planning stage, a dictation stage, and a revision-editing-correction stage, these stages are not discrete; they include repeated or on-going activities, such as planning and attending to audience, content, and style. Thus the process of dictation resembles the process of writing in its most essential features, with differences occurring at the sub-process level.

How Teachers Can Help Students Adapt Their Writing to the New Technology

Although teachers of general or advanced composition are not generally responsible for teaching on-the-job writing, they can help students adapt their writing skills to the new technology in several ways. First, they can discuss the new communication systems, perhaps giving assignments which encourage students to read, write, and share their findings. Articles on the subject have appeared in the past year in such newspapers and magazines as Business Week, Newsweek, The New York Times, Psychology Today, Time, and The Wall Street Journal. They also appear in trade publications such as Datapro, Word Processing Systems, and Word Processing World, and in specialized publications in almost every field college graduates are likely to enter, from sales to computer science to education to management. And general and specialized reference books contain useful background

information on dictation/word processing systems and on the office of the future. An assignment on this subject -- whether expository, persuasive, descriptive, or imaginative -- would certainly serve as a useful introduction for an entire class.

Second, teachers can create classroom environments in which students have opportunities to speak, listen, read, and write. While specific strategies which combine speaking and writing are especially useful, [30] a general atmosphere in which all phases of language are nurtured is certainly helpful to students who will have to adapt their language skills once they graduate.[31] Such an emphasis on general language processes fosters proficiency in writing and dictating.

And finally, teachers can emphasize, as they move through the recursive stages of the writing process, those sub-processes which differ in writing and dictating.

The Planning Stage

In the planning stage, the most distinctive differences between writing and dictating for word processing systems are: 1) the need to attend simultaneously to two audiences; 2) the need to thoroughly organize content in advance; and 3) the need to distinguish between habits of speaking and conventions of writing. Effective dictation requires that the secondary audience, the transcriber, be fully apprised of what he or she is to do, not only in terms of general format, spelling, and mechanics, which are relatively easy directions to dictate, being spoken translations of habitual and sequential writing activities, but in terms of referencing materials, additions, changes, and other idiosyncratic features of a given communication. To construct a communication which is clear to the long-term audience, achieves the intended purpose, and conveys the image the writer seeks to

project, students must be encouraged to attend to the needs of short-term as well as long-term audiences.

Similarly, efficient dictation requires careful advance planning, which usually includes organizing reference materials in easily accessible form, making mental or written notes or detailed outlines, or following very structured patterns of presentation, as in adapting forms and in dictating records. Although experienced dictators of first-time-final communications seem to have developed the knack of mental outlining, students must be encouraged to combine mental planning with note-taking and outlining.

Finally, effective dictation requires a sensitivity to differences between speaking and writing, especially in preparing first-time-final communications. Although students may think they will be able to trim wordiness, improve sentences, and, in general, polish their prose in tape or draft revision, the evidence suggests that habits of speech are not consistently corrected in either tape or draft editing. Students must therefore be trained to avoid such speech-related pitfalls as repetition and wordiness and to review this training as they plan their dictation.

Teachers can help students adapt their planning strategies for writing to dictating by simulating pre-dictation situations in class. When teachers discuss gathering materials, note-taking, and outlining, for instance, they can have students bring to class all the materials they will need to plan a one-page communication to be dictated for a real-world audience -- perhaps an announcement describing a new school service or event, a response to a newspaper article on a controversial subject, or a letter to voters introducing a political candidate. Teachers can then have the students plan the communication, giving careful attention to the needs of long-term and possible short-term audiences. In addition, teachers can explain differences between habits of speaking and conventions or writing, such as

repetition, syntactic embedding, tense switching, and unclear pronoun reference.[32] Having students hear and see unedited transcripts of one or two short conversations, then having them revise the transcripts into conventional written form will allow students to discover as a class key differences between speaking and writing.

The Writing/Dictating Staff

The most distinctive differences between writing and dictating for word processing are: 1) planning short units of discourse; 2) following systematic structures; and 3) adding new or overlooked information. In writing, such activities are easy to adjust -- by crossing out, erasing, drawing arrows, and cutting and pasting; in dictating, they require consistent attention.

While dictators are sometimes aware that they plan their paragraphs or sentences before they articulate them, they are generally unaware of the phrasal nature of dictation. Although many writers favor dictation because it improves fluency or allows them to capture elusive thoughts more readily than writing does, my research suggests that dictating, like speaking, is phrasal in nature. Unlike speaking, however, dictating requires a sensitivity to the conventions of writing and an effort to emulate them when using recording equipment. This, of course, requires pausing -- both to control meaning and to simulate written speech. Students should therefore be taught that pauses are natural in dictation.

One procedure that seems to reduce phrasal pausing in dictation is following set patterns of presentation. Although many dictators follow a mentally outlined form when dictating routine communications or records, the main drawback of patterning in first-time-final communications or drafts may be reliance on certain clichés, which serve as springboards to specific

units of the pattern. Students should therefore be encouraged to use patterns when appropriate, but also warned against the potential problems associated with them.

The third characteristic of dictation, accessing new or overlooked information on a tape, seems to be a problem mainly in dictating first-time-final communications, where it is necessary to alert the short-term audience -- either at the beginning of the tape, if adequate space has been allotted, or in an accompanying note -- to be prepared to adjust the transcription to accommodate the new material. Students therefore need training in accessing new information in spoken as well as in written form.

To help students become familiar with the processes (and pitfalls) of dictation, teachers can have students apply what they have learned in their planning strategies in a practice dictation. The day after students have planned a one-page communication for a real-world audience, some of them can bring to class tape recorders and actually dictate from their notes or outlines. Teachers can then spend the rest of the class hour having students play back several of the tapes and discuss the difficulties they encountered -- such as attending to long- and short-term audiences -- and the changes they would make in revision. When discussing the tapes, students are bound to make several observations: first, that they do, indeed, dictate in phrases; second, that those who have taken public speaking or debate courses seem more fluent because they follow one of several established patterns of presentation -- for example, making a point, supporting it with three reasons, and ending; and, finally, that it is much more difficult to add afterthoughts while dictating than while writing.

Revising/Editing/Correcting Stage

In the revising/editing/correcting stage, the most distinctive differences between writing and dictating include two closely-related features: 1) the

focus on content rather than style; and 2) the collaborative nature of editing. Even Galler, who seems to be unusually sensitive to style, admitted that as long as the content is correct, he often lets repetitions or otherwise inelegant phrasings slip through for expediency; most of my other interviewees either did not notice stylistic problems or attended only to content, assuming that the private or group secretary would correct style, spelling, and mechanics. For example, George Heighway of the Indiana State Board of Health said that he never reviews his tapes because he knows his secretary will fix "everything" -- by which he means grammar, spelling, and punctuation -- on the drafts, and that he pays attention mainly to content. But since entry level dictators are unlikely to have private or group secretaries who will fix everything, students must learn to pay particular attention to revising and proofreading.

Teachers can help them become good style editors in several ways. One involves having them attend closely to differences between speaking and writing, described above. A second is having them revise and edit their work -- in peer groups, which simulates the common business practice of circulating manuscripts in draft form, and individually, after teacher evaluation, which simulates the practice of submitting a specific communication to the "boss" and editing it accordingly. And a third way to help students is to give them practice in closely examining and revising business communications they or their families receive in the mail, communications which are likely to be wordy, tactless, cliché-filled, or otherwise lacking stylistic polish.

When we realize that most of the "writing" our students will do once they leave the classroom will depend on their ability to adapt what we have taught them to the new communications systems they will find on their

jobs, we need not feel frustrated or alarmed. We can, if we introduce this new and exciting subject in our classrooms, feel confident that we have helped our students adapt what they have learned in our classes to the world they will enter after college.

REFERENCES

1. "Fast Growth Expected in Speech Processing," Word Processing World, September, 1978, p.8; "Function and Form in the Automated Office," Datapro, November 1978, pp.114-117.

2. "Research in Writing on the Job," panel presentation, Conference on College Composition and Communication, Washington, D.C., 1980, suggested differences between the recursive model and real-world practice. Especially important research in this field is being done by Linda Flower, Dixie Gotswami, John Gould, Lee Odell, and Barrie Van Dyke.

3. Walter Ong, Interfaces of the Word: Studies in the Evaluation of Consciousness and Culture (Ithaca: Cornell University Press, 1977), p. 86.

4. "Phoenix Improves Productivity with WP Operations," Word Processing Systems, June, 1980, pp.14-17.

5. Elizabeth J. Ruddy, executive assistant to the President, Manufacturing Data Systems Incorporated, Ann Arbor, MI: Interviewed by Jeanne W. Halpern, June 26, 1980.

6. "WPS Measures Dictation Usage," Word Processing Systems, February 1980, p. 22.

7. For relative proportions of lines dictated and transcribed from longhand for word processing, see the 1979 year-end totals of the department-wide system of the Indiana State Board of Health, Administration and Correspondence Center, summarized below.

1979 ADMINISTRATION CORRESPONDENCE CENTER
MONTHLY MAG CARD PRODUCTION (LINE COUNT)

MONTH 1979	MACHINE DICTATION	LONGHAND
Jan.	51,474	12,718
Feb.	45,543	11,523
Mar.	62,191	6,417
April	41,679	7,208
May	57,671	9,511
June	40,846	8,901
July	44,544	10,639
Aug.	53,691	6,699
Sept.	37,657	7,068
Oct.	45,827	8,171
Nov.	39,131	7,315
Dec.	37,391	3,566

8. John Gould, "Experiments on Composing Letters," in Cognitive Processes in Writing, eds., Gregg, L.W., and E.R. Steinberg, Hillsdale, N.J.: Lawrence Erlbaum, 1980, pp.97-127. Gould, a research psychologist at IBM, showed that expert dictators produced short business letters 60% faster than they wrote such letters and produced complex letters about 20% faster. He also showed that potential output rates comparing writing to dictation, sometimes claiming a 400% - 500% advantage for dictation, are unrealistic because they do not take into account planning time, which is a constant ratio in both production methods.

9. Alan T. McKenzie, "QWERTYUIOP: Word Processors and the Typing Chores of an English Department," ADE Bulletin, February 1980, pp.18-21, describes a variety of cost savings, from the typing of responses to job applicants to the correction and updating of bibliographies, where the new word processing systems save time as well as money.

10. Howard Gardner, "On Becoming a Dictator," Psychology Today, December, 1980, p. 19.

11. "Dictation Today: Voices of the Users," Modern Office Procedures (March, 1979), p. 70. Interviewees in my study gave as reasons for not using the new systems: reluctance to switch from the known to the unknown; inadequate training; and fear that they would not use the equipment correctly and ruin their communications.

12. John Gould, op. cit., p. 101.

13. Janet Emig, "Writing as a Mode of Learning," College Composition and Communication, May, 1977, pp. 122-128.

14. Linda Flower, "Writer Based Prose: A Cognitive Basis for Problems in Writing," College English, Vol. 41, #4, September, 1979, pp.19-37.

15. Donald Murray, "Internal Revision: A Process of Discovery," in Research on Composing: Points of Departure, eds., Charles R. Cooper and Lee Odell (Champaign: National Council of Teachers of English, 1978), pp. 85-103.

16. Barrie Van Dyke, "On-the-Job-Writing of High Level Business Executives: Implications for College Teaching," unpublished manuscript of a paper presented at the Conference on College Composition and Communication, Washington, March, 1980.

17. The form contained 11 questions, which included: What percent of your time is spent writing? What percent dictating? What kinds of communications do you dictate? Describe the process you go through when you dictate. How does your dictation differ from your writing? What specific skills do you need to dictate?

18. William Murchie, Director of the Bureau of Management and Services, Indiana State Board of Health, was the only executive interviewed who wrote his communications before dictating them.

19. Material in this section was collected during structured interviews with Professor Bernard A. Galler at the University of Michigan Computing Center, Ann Arbor, June 6 and July 28, 1980; interviewer, Jeanne W. Halpern.

20. If the typist uses magnetic cards and an electronic typewriter to make corrections, she is likely to reuse the cards once the specific communication is sent out; if she types at the word processing keyboard, she will file the cards -- if they are to be used in future work -- for later referral or updating.

21. Source: Structured interviews with Peggy Jeannottee, Supervisor of the Word Processing Center, Manufacturing Data Systems International (MDSI), and other members of the MDSI staff, in Ann Arbor, MI, July 2, 1980; interviewer, Jeanne W. Halpern.

22. Sources: Structured interviews with Pamela Graves, Claims Service Specialist, and Gloria Desenfantes, Word Processing Supervisor, State Farm Insurance, W. Lafayette, IN, September 3, 1980; and structured interview with Earl McIntyre, op. cit.

23. Material in this section was collected during a structured interview with Dr. William Sonzongi at the U.S. Great Lakes Basin Commission, June 26, 1980; interviewer, Jeanne W. Halpern.

24. J.W. Gibson and others, "A Quantitative Examination of Differences and Similarities in Written and Spoken Messages," Speech Monographs 33 (1966), pp. 446-451.

25. John Gould, op. cit., pp.103 and 109, confirms the observation that dictators rarely revise their own work.

26. Howard Gardner, op. cit., p. 14. John Gould also refers to the "spew" strategy of dictation, which resembles Peter Elbov's drafting advice to students of writing in Writing Without Teachers (New York: Oxford University Press, 1972), pp.3-11. None of the interviewees in my research used this drafting strategy in dictation.

27. Source: Structured interview with Timothy Montheith, GLBC, June 26, 1980; interviewer Jeanne W. Halpern.

28. Structured interview with Earl McIntyre, Credit Manager, Manufacturing Data Systems International, July 2, 1980; interviewer, Jeanne W. Halpern.

29. George Heighway, Director, Division of Health Facilities, Indiana State Board of Health, encourages his entire staff to dictate and has observed that initially they write fairly detailed outlines, even when dictating short responses, then dictate from notes, and finally learn to dictate from mental notes, with the necessary documentation at their fingertips. He confirms that in the process, they learn to speak writing effectively.

30. Tovatt, Anthony, The Oral-Aural-Visual Program for Teaching Language Arts (Indianapolis: Indianapolis Public Schools, 1968) offers suggestions for using tape recorders in teaching writing.

31. See Moffett, James, Teaching the Universe of Discourse (Boston: Houghton Mifflin, 1968).

32. For a summary of differences between habits of speaking and conventions of writing, see Jeanne W. Halpern, "Differences between Speaking and Writing and Their Implications for Teaching," College Composition and Communication, forthcoming.

(Note clipped to signed letter.)

afi Add Hank Tropp to the cc list.

ANNALS OF THE HISTORY OF COMPUTING

Editor-in-Chief, Bernard A. Galler
Assistant Editor-in-Chief, Nancy Stern

Reply to:

Computing Center
University of Michigan
1075 Beal Avenue
Ann Arbor, MI 48109
313/764-9595

June 4, 1980

/i

Professor Fritz L. Bauer sp i
Institute fur Informatik
Arcisstrasse 21
D-8000 Munich
GERMANY

/Dear Fritz,

/It was a great shock to learn/about Klaus Samelson, /I remember very well/the good times and the arguments we had over ALGOL 58/./ I know especially that you and he were very close colleagues, and I'm sure that he will be greatly missed./

i /When/Heinz Zemanek told me about Klaus, we discussed/the preparation of a memorial article/for the *Annals*. Heinz suggested that you would be the appropriate person to write such a memorial, if/you would be willing to do so. //We have now had several such memorials in the *Annals*, and/you could get an idea of what might be appropriate from them. /Please let me know if you are willing to do this./

Omitted for me that

Sincerely,

Bernard A. Galler

BAG:kls

cc: Nancy Stern
Heinz Zemanek
Mondy Dana
i /

Annotation Key

/-tape stop
i-instructions to secretary
sp-spelling direction
v-sound pause
+-pause filler--ah,throat clear
^-punctuation direction
o-secretary omitted
e-secretary changed
e-secretary added
x-dictator's rewording

Figure 1: Sample first-time-final communication, marked for pauses, tape stops, instructions to typist and secretarial editing.

Agenda

How
Ecosystem Concept — IFYGL - type
Study

Early September - next Meeting

Meet in AA during summer
to fix agenda

Figure 2: Original notes for dictated draft, 6/10/80.

R&D

Basic Lake Research (= Processes, Fate)
Economics (Quantifying Costs & Benefits)
Human Health Risks
Ecosystem Studies - Interactions; Looking at the big picture (i.e., point & nonpoint sources concurrently; ~~an effect~~ of Practical options; how can institutions be ~~if~~ more effective by taking an ecosystem approach

Monitoring & Data storage - how can it be done more economically & cost-effectively

Little New Came Out of Workshop
Major Points
Still need to adjust analysis plan ~~to~~ to respect to perceived needs. Congress can't assess what needs are being inadequately addressed

~~Heard~~
GLBC Ecosystem ~~Paper~~ PTS (Preproposal
~~DB~~ Berry & Swain Paper

Figure 3: Notes developed into outline before dictation, 6/11/80.

~~Proposal for~~

Ideas on developing a proposal (suitable for NSF or similar organization) for gathering detailed info on the Great Lakes ecosystem. Integrated interagency study. ~~Write~~ Parker letter of intent. Sorg. to meet w Beeton; Meeting in September

Swain
Aubert
Beeton
Chesters
Habegger
Sonzogni

Figure 3: Continued.

#3.11

STANDING COMMITTEE ON RESEARCH AND DEVELOPMENT ← Proper name for Committee? (S)

Traverse City, Michigan ← OK? (S) ✓

June 10, 1980/ (D)

(Meeting Held during Workshop on NOAA's 5-Year Plan for G.L. Research, Development and Monitoring)

SUMMARY OF ACTIONS

(S)/1./ A brief meeting of the committee/was held during the/NOAA-sponsored workshop/on the Great Lakes Research, Development and Monitoring. //Since this workshop addressed one of the long-range objectives of the R&D Committee, and since it is chaired by the current A&D Committee (D) chairman, Dr. Beeton, ~~of the R&D Committee~~ (D) ^all members of the R&D Committee were invited to attend. /In the way of a brief summary of this workshop, several major research areas (D) were/recurrent/throughout the workshop:

(a)/basic scientific research on the processes and/rates of contaminants in the Great Lakes system;

(b)/the ~~need to get a better handle on~~ (D) quantitative information (D) economics associated with water pollution/(i.e., /the need to quantify costs and benefits)//

(c) the urgent need for additional information on/human health risks from

Omitted the

(S) ? (S) ✓ (S) ✓

Annotation Key

/ - tape stop
i - instructions to secretary
sp- spelling direction
v - sound pause
+ - pause filler--ah, throat clear
^ - punctuation direction
o - secretary omitted
● - secretary changed
● - secretary added
x - dictator's rewording
(S) - Secretary's original questions and later checks that corrections were made.
(D) - Dictator's corrections

Figure 4: Segment of transcription, 6/12/80, showing pauses, tape stops, and other dictation features, plus questions and checks by typist and revisions by dictator. (Photographically reduced from 11" X 14" printout sheets)

contaminants found in the lakes!

(d) ~~The area not~~ comprehensive research programs which treat the lakes as an ecosystem (the need to look at the "big picture" was stressed, and the need to identify interactions, such as the need to look at point and nonpoint control programs concurrently or how phosphorus control programs may affect toxic substances inputs, was identified; how institutions can be more effective by taking an ecosystem approach was also identified).

Omitted
"end of parens"
"another parens"

(e) research is ~~needed~~ on how monitoring and data storage can be done more economically ~~scientifically~~ and effectively.

Omitted
"another parens"

To here → 3. A paper by Drs. Sonzogni and Swain has been prepared to further publicize the results of the committee's past workshop on the "Scientific Basis for Dealing with Chemical Toxic Substances in the Great Lakes". This paper also attempts to bring up to date the general picture of research on toxic substances in the Great Lakes (based on a recent inventory of ongoing research done for the committee) and incorporates information on ongoing toxic research versus perceived needs. The paper also presents some new information on human health concerns. The paper is being submitted to the Journal of Great Lakes Research along with a paper developed by Dr. Robert Thomann from his presentation at our workshop. Neither of the other two invited speakers (Dr. Anders Andren and Dr. Rich Thomas) were able to develop their presentations into papers. A copy of the Swain and Sonzogni paper is attached for your information. A copy of Dr. Thomann will be forwarded shortly.

just elsewhere? 4. NOTE: It was observed that no attempt was made at the NOAA workshop ~~As a result of the conference, there is still a need~~ to analyze the

Figure 4: Continued

Logo

STANDING COMMITTEE ON RESEARCH AND DEVELOPMENT

Traverse City, Michigan
June 10, 1980

(Meeting Held during Workshop on NOAA's
5-Year Plan for Great Lakes Research, Development and Monitoring)

SUMMARY OF ACTIONS

1. A brief meeting of the committee was held during the NOAA-sponsored workshop on Great Lakes research, development and monitoring. Since this workshop addressed one of the long-range objectives of the R&D Committee, and since it is chaired by the current R&D Committee chairman, Dr. Beeton, all members of the R&D Committee were invited to attend. In the way of a brief summary of this workshop, several major research needs were recurrent throughout the workshop:

   (a) basic scientific research on the processes and fates of contaminants in the Great Lakes system;

   (b) more quantitative information on the economics associated with water pollution (i.e., the need to quantify costs and benefits);

   (c) the urgent need for additional information on human health risks from contaminants found in the lakes;

   (d) comprehensive research programs which treat the lakes as an ecosystem (the need to look at the "big picture" was stressed, and the need to identify interactions, such as the need to look at point and nonpoint control programs concurrently or how phosphorus control programs may affect toxic substances inputs, was identified; how institutions can be more effective by taking an ecosystem approach was also identified);

   (e) research on how monitoring and data storage can be done more economically and effectively.

2. It was observed that no attempt was made at the NOAA workshop to analyze the needs developed at the workshop with respect to the actual five year federal plan. At the time of the conference, such a plan, at least the 1980 plan, was not available. It is important that Congress receive

I think we should identify which workshop if different from NOAA

1

or drop "at the workshop" if it's the same one.

Figure 5: Segment of corrected second draft, 6/15/80, with handwritten revision suggestions by outside reader, 6/16/80.

Great Lakes Basin Commission

STANDING COMMITTEE ON RESEARCH AND DEVELOPMENT

Traverse City, Michigan
June 10, 1980

(Meeting Held during Workshop on NOAA's
5-Year Plan for Great Lakes Research, Development and Monitoring)

SUMMARY OF ACTIONS

1. A brief meeting of the committee was held during the NOAA-sponsored workshop on Great Lakes research, development and monitoring. Since the NOAA workshop addressed one of the objectives of the R&D Committee, namely long-term planning for research, all members of the R&D Committee were invited to attend. In the way of a brief summary of the NOAA workshop, several major research needs were recurrent:

   (a) basic scientific research on the processes and fates of contaminants in the Great Lakes system;

   (b) more quantitative information on the economics associated with water pollution (i.e., the need to quantify costs and benefits);

   (c) the urgent need for additional information on human health risks from contaminants found in the lakes;

   (d) comprehensive research programs which treat the lakes as an ecosystem (the need to look at the "big picture" was stressed, and the need to identify interactions, such as the need to look at point and nonpoint control programs concurrently or how phosphorus control programs may affect toxic substances inputs, was identified; how institutions can be more effective by taking an ecosystem approach was also identified);

   (e) research on how monitoring and data storage can be done more economically and effectively.

2. It was observed that no attempt was made at the NOAA workshop to analyze research needs with the actual five year federal plan. At the time of the conference, the 1980-1985 plan was not available. It is important that Congress receive information on what needs are being inadequately addressed, not just the needs. Consequently, the R&D Committee may wish to address this problem.

1

Figure 6: Segment of final version of Summary of Actions, 6/18/80.